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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/630,694

07/31/2003

Tomiji Tanaka

241069US6

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7590

08/05/2004

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EXAMINER

LAVARIAS, ARNEL C

ART UNIT

PAPER NUMBER

2872

DATE MAILED: 08/05/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

10/630,694

**Applicant(s)**

TANAKA ET AL.

**Examiner**

Arnel C. Lavarias

**Art Unit**

2872

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 31 July 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
  - 2) ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Priority***

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

### ***Drawings***

2. The drawings were received on 7/31/03. These drawings are acceptable.

### ***Specification***

3. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification. Examples of such errors are noted below.
4. The disclosure is objected to because of the following informalities:  
Page 32, line 2- '11' should read '12'.  
Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1-3, 9, 12-14, and 18 are rejected under 35 U.S.C. 102(b) as being anticipated by Long (U.S. Patent No. 5986781).

Long discloses a holographic recording apparatus and method (See for example Figures 1-2, 10-13), the apparatus and method comprising a laser source emitting laser beams (See 50 in Figure 1); a diffraction control element (See 68 in Figure 1; col. 6, line 38-col. 7, line 49) for receiving a laser beam emitted from the laser source and controlling the diffraction of the received laser beam before letting it exit; a diffracted light component blocking element (See 76 in Figure 1; col. 7, line 50-col. 8, line 6) for blocking a predetermined diffracted light component in the diffracted light emitted from the diffraction control element; and a condensing element (See 78 in Figure 1) for condensing diffracted light component that has not been blocked by the diffracted light component blocking element onto a hologram recording medium (See 80, 81 in Figure 1). Long additionally discloses the diffraction control element having a plurality of individual diffraction control elements that control the diffraction of the received laser beam independent from each other (See 68 in Figure 1; Figure 4; col. 6, line 38-col. 7, line 49; col. 9, line 29-col. 10, line 25); the diffracted light component blocking element blocking tertiary diffracted light or more in terms of an absolute value by the individual diffraction control elements (See 76 in Figure 1; col. 7, line 50-col. 8, line 6); the condensing element comprising a plurality of lenses (See 78 in Figure 1; col. 8, lines 7-22); and a recording medium (See 80, 81 in Figure 1) for recording data by using diffracted light obtained by blocking a predetermined diffracted light component in diffracted light emitted from a

diffraction control element that controls the diffraction of a laser beam before letting the laser beam exit.

7. Claim 18 is rejected under 35 U.S.C. 102(b) as being anticipated by Lewis (U.S. Patent No. 3677616).

Lewis discloses a recording medium (See 73 in Figure 6) for recording data by using diffracted light obtained by blocking (See 33, 35 in Figure 6; col. 4, lines 16-33) a predetermined diffracted light component in diffracted light emitted from a diffraction control element (See 27 in Figure 6; col. 4, lines 19-42) that controls the diffraction of a laser beam (See 11 in Figure 6) before letting the laser beam exit.

### *Claim Rejections - 35 USC § 103*

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 1-3, 9-10, 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lewis in view of King et al. (U.S. Patent No. 6700686).

Lewis discloses a holographic recording apparatus and method (See for example Figure 6), the apparatus and method comprising a laser source emitting laser beams (See 11 in Figure 6); a diffraction control element (See 27, 41 in Figure 6; col. 4, lines 19-42; col. 5, lines 21-32) for receiving a laser beam emitted from the laser source and controlling the diffraction of the received laser

beam before letting it exit; and a diffracted light component blocking element (See 33, 35 in Figure 6; col. 4, lines 16-33) for blocking a predetermined diffracted light component in the diffracted light emitted from the diffraction control element. Lewis additionally discloses the diffraction control element having a plurality of individual diffraction control elements that control the diffraction of the received laser beam independent from each other (See col. 4, lines 19-42; col. 4, lines 59-64; col. 7, lines 9-24); a light dividing element (See 75 in Figure 6) for dividing a laser beam emitted from the laser source into first and second light beams and causing the first light beam to enter the diffraction control element; a second condensing element (See 83 in Figure 6) for condensing the second light beam emitted from the light dividing element onto a spot on the hologram recording medium where a laser beam emitted from the condensing element has been condensed; and the diffracted light blocking element blocking all orders of diffracted light except for two diffracted orders of light (i.e. the principle zero order and one other order of light) (See 33, 35 in Figure 6; col. 4, lines 19-58). Lewis lacks one or more condensing elements for condensing diffracted light component that has not been blocked by the diffracted light component blocking element onto a hologram recording medium (See 73 in Figure 6). However, the use of focusing optics, such as one or more converging or condensing lenses, for focusing incident light down onto a holographic recording medium are well known in the art. For example, Curtis et al. teaches a holographic storage apparatus for recording information into a holographic recording medium (See for example Figures 1-2; Abstract). In particular, object

or signal light (See 225 in Figure 2) that has been encoded by a spatial light modulator (See 255 in Figure 1) is focused down to a spot on the holographic recording medium (See 250 in Figure 2) using a converging lens (See 280 in Figure 2). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have the holographic recording apparatus and method of Lewis further include one or more condensing elements for condensing diffracted light component that has not been blocked by the diffracted light component blocking element onto a hologram recording medium, as taught by King et al., for the purpose of increasing storage capacity by utilizing less space on the holographic recording medium for each recording.

10. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lewis in view of King et al.

Lewis in view of King et al. discloses the invention as set forth above in Claims 1 and 10, except for a light blocking element for blocking the first light beam emitted from the light dividing element; and a light receiving element for receiving light emitted from the hologram recording medium on the basis of the laser beam converged onto the hologram recording medium by the second condensing element. It is noted that the use of shutters or the SLM itself for blocking the object beam during readout or reconstruction of the hologram is well known in the art. Further, it is known in the art to utilize a light receiving element, such as a CCD camera or photodetector array to receive the holographic information that is reconstructed when only the reference beam is incident on the holographic recording medium. See for example Figure 2; 250, 284, 286 in

Figure 2; col. 6, lines 20-67 of King et al.). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have the holographic recording apparatus and method of Lewis in view of King et al. further include a light blocking element for blocking the first light beam emitted from the light dividing element; and a light receiving element for receiving light emitted from the hologram recording medium on the basis of the laser beam converged onto the hologram recording medium by the second condensing element, for the purpose of reducing the number of optical systems, and hence cost, required for recording and reconstructing a hologram (i.e. only a single shared optical system is required, instead of two separate optical systems).

11. Claims 4-8, 15-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lewis in view of King et al. as applied to Claims 1-2, 12-13 above, and further in view of Bloom et al. (U.S. Patent No. 5311360).

Lewis in view of King et al. discloses the invention as set forth above in Claims 1-2, 12-13, except for the modulator and object transparency of Lewis (or the SLM of King et al.) being a grating light valve. However, Bloom et al. teaches grating light valve for use in spatial light modulator applications (See for example Figure 2, 10; Abstract; col. 1, line 17-col. 3, line 7; col. 3, line 31-col. 4, line 42). In particular, Bloom et al. teaches a grating light valve (See for example Figure 9) having individual control elements (See for example 66, 68, 70, 72 in Figure 10) having first and second phase control elements (See for example each individual ribbon 18 in Figure 2) for controlling phase differences among output going light from each element; the outgoing light beams from the first and second

control elements being diffracted light beams that have been diffracted by the first and second control elements (See col. 6, lines 18-47); the first and second phase control elements being ribbon shaped (See 18 in Figure 2); and the either the first or the second phase control elements being displaced by an electrostatic force (See col. 6, lines 18-41). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have the modulator and object transparency of Lewis (or the SLM of King et al.) be a grating light valve, as taught by Bloom et al., to take advantage of the high efficiency, high contrast, low cost of manufacturing, and direct integration with electronics of the grating light valve over other existing SLM's.

### *Conclusion*

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Arnel C. Lavarias whose telephone number is 571-272-2315. The examiner can normally be reached on M-F 8:30 AM - 5 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew Dunn can be reached on 571-272-2312. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2872

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Arnel C. Lavarias  
8/4/04



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